a. side view

b. top view

Fig. 6   Geometrical arrangement for Antenna 2. The dimensions are shown in terms of the cell lengths δ_x, δ_y, and δ_z in the x-, y-, and z-directions, respectively. For the FDTD calculations, $\delta_x = \delta_y = 1.974$ mm, $\delta_z = 1.5$ mm.
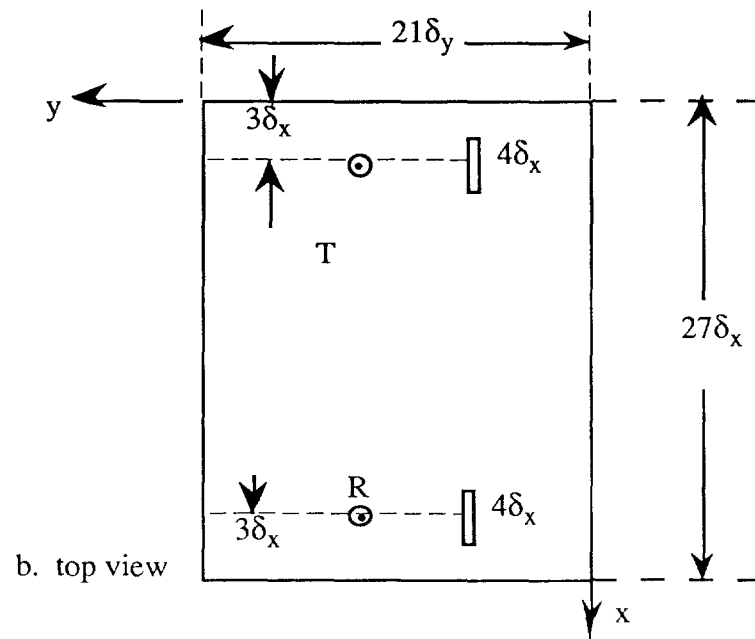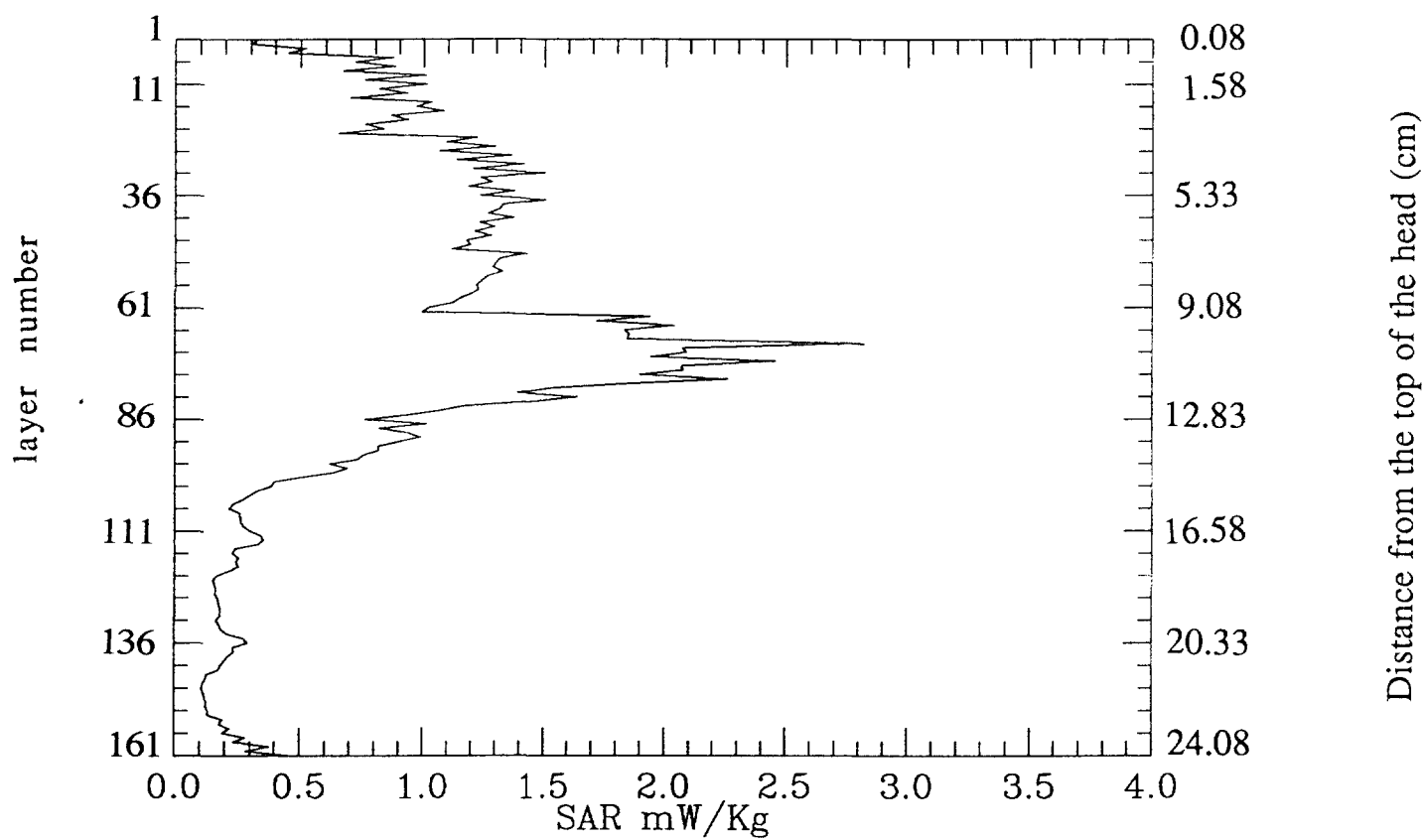
Fig. 7   Geometrical arrangement for **Antenna 3**. This antenna is similar to Antenna 2 except that a somewhat wider and taller reflector is used. Also, the driven elements T and R (transmitting and receiving) are centrally located relative to their respective reflectors.
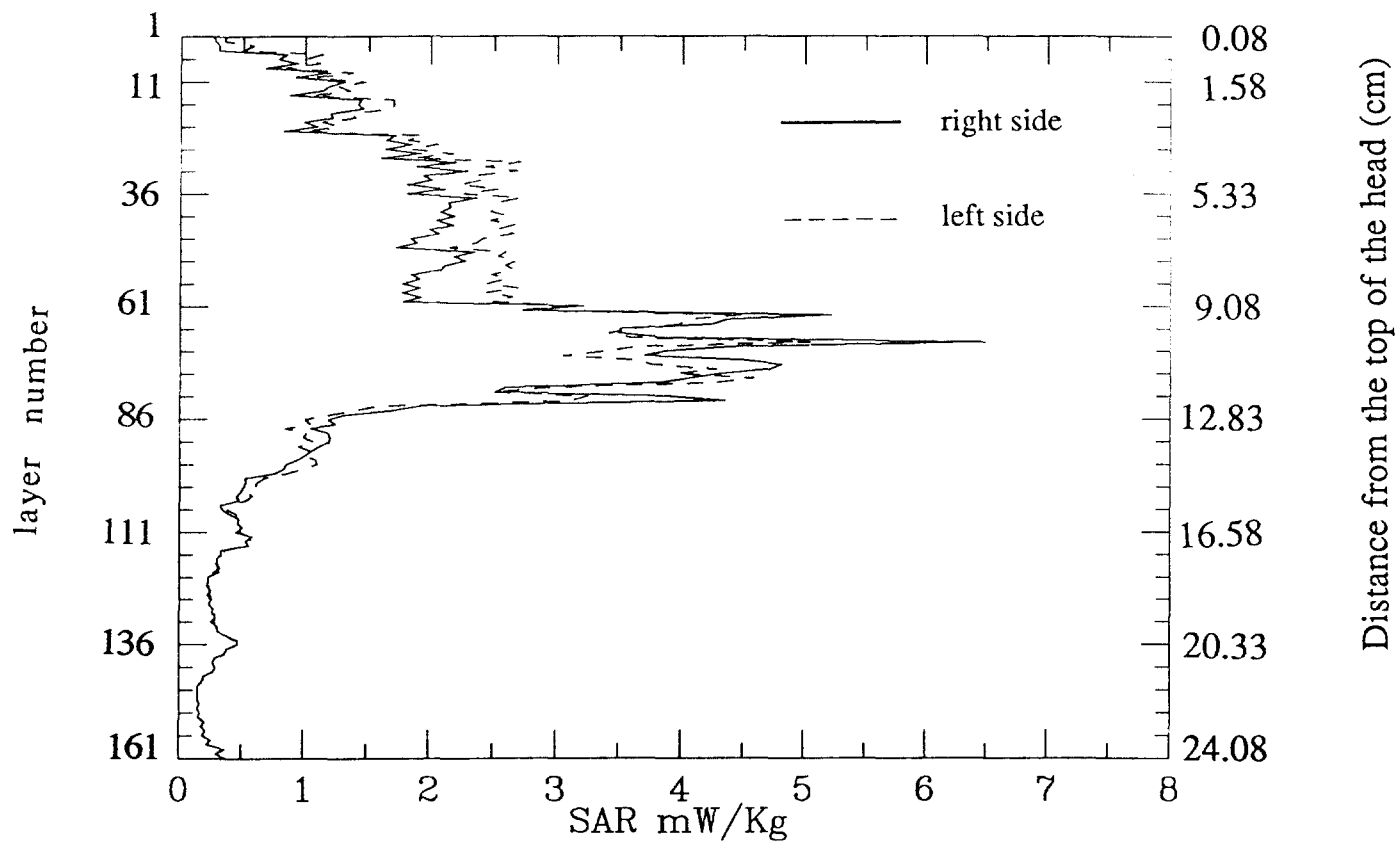
a. Antenna 1 held against the right side of the head.

Fig. 8. Layer-averaged SAR distributions for the high-resolution model of the head and neck.
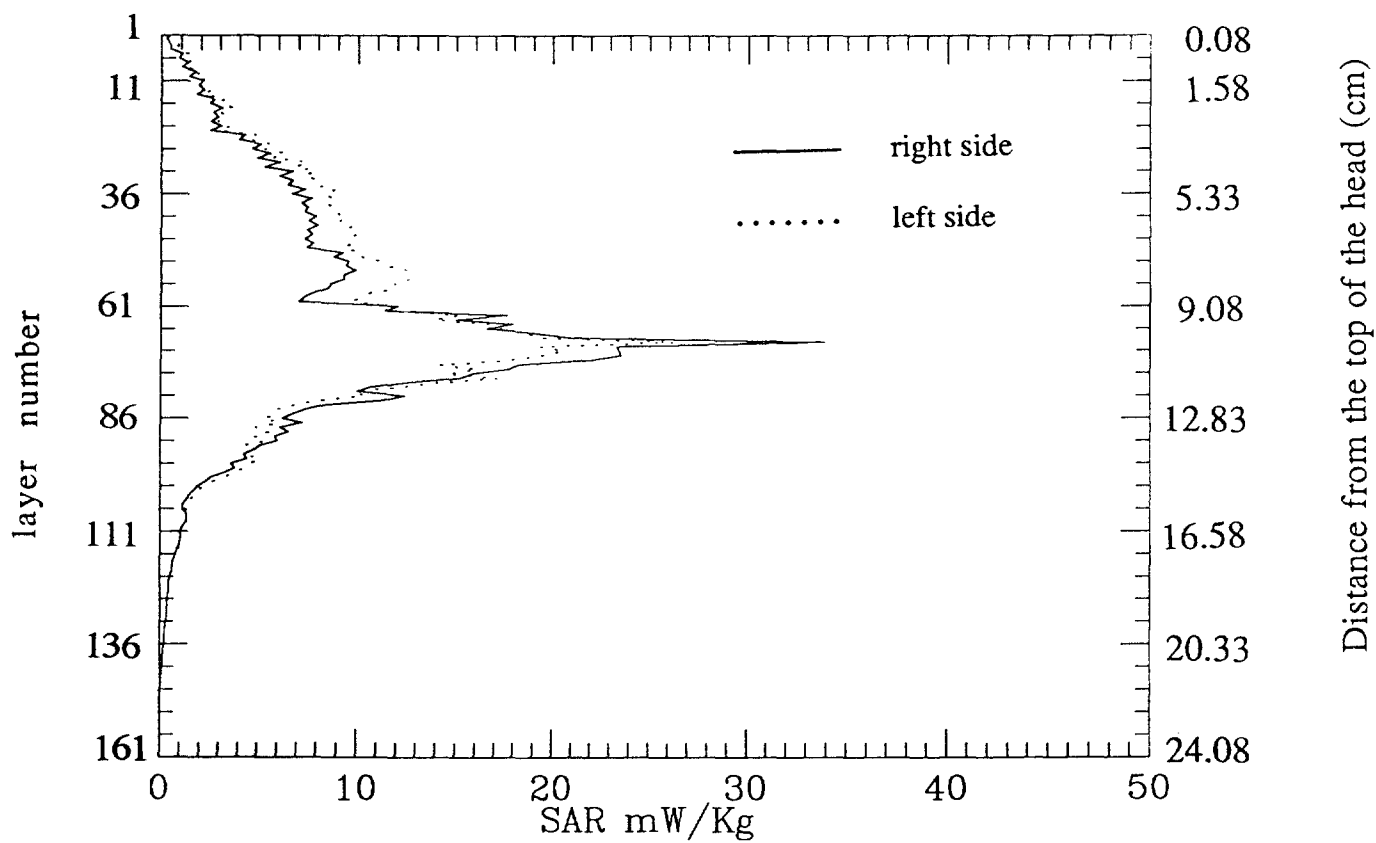
b. Antenna 2 held against the right and the left sides of the head.

Fig. 8 (continued)

c. Antenna 3 held against the right and left sides of the head.

Fig. 8 (continued)

a. layer no. 60

SAR mW/Kg

2000
1800
1600
1400
1200
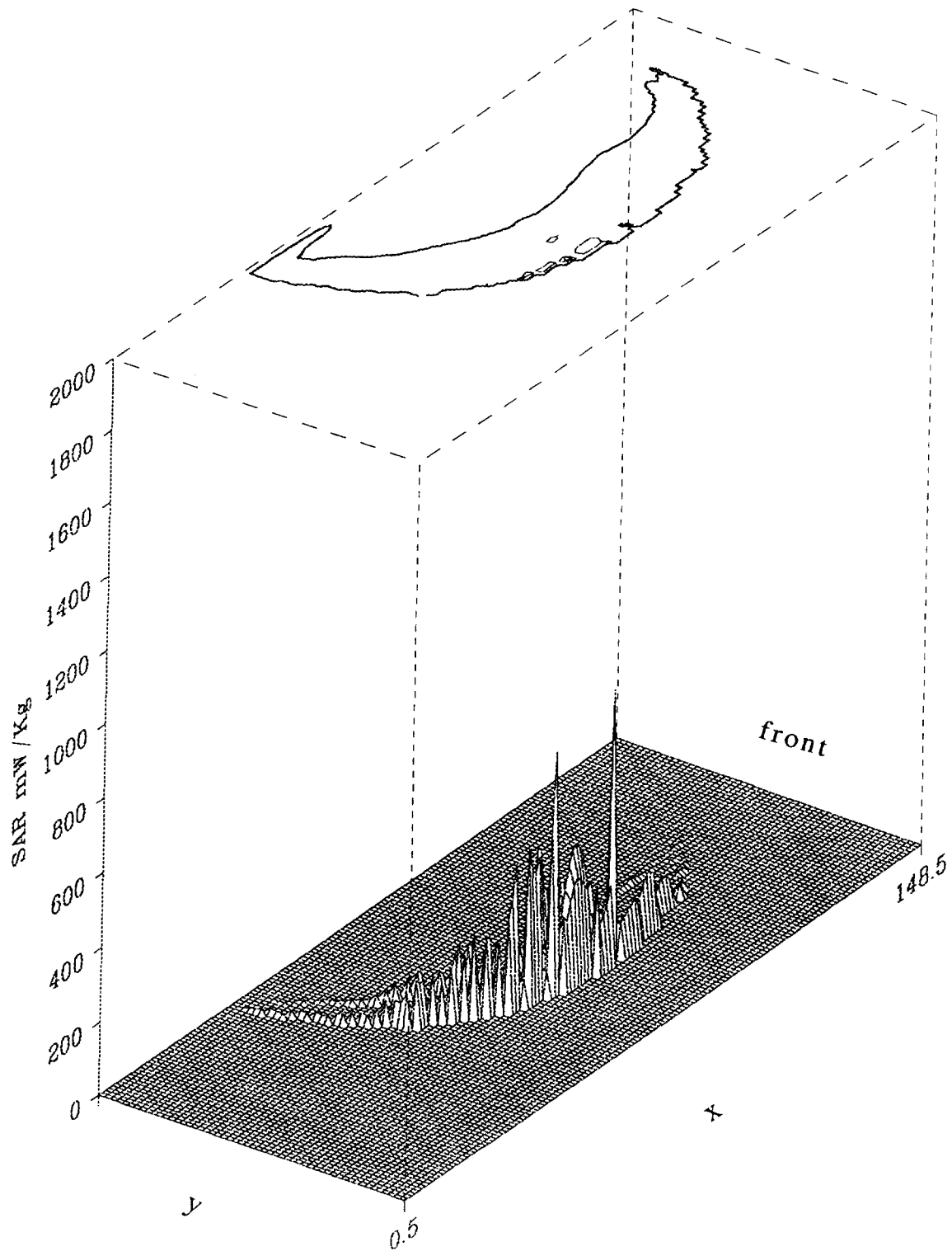1000
800
600
400
200
0

front

148.5

x

y

0.5

Fig. 9. Calculated SAR distribution for three representative layers of the head for Antenna 2 held on the right side of the head. Layer no. 69 is in the xy plane containing the driving point of the antenna and layers 60 and 75 are 1.35 cm above and 0.9 cm below this plane, respectively. The axes x and y are from front to back, and from side to side of the head, respectively.
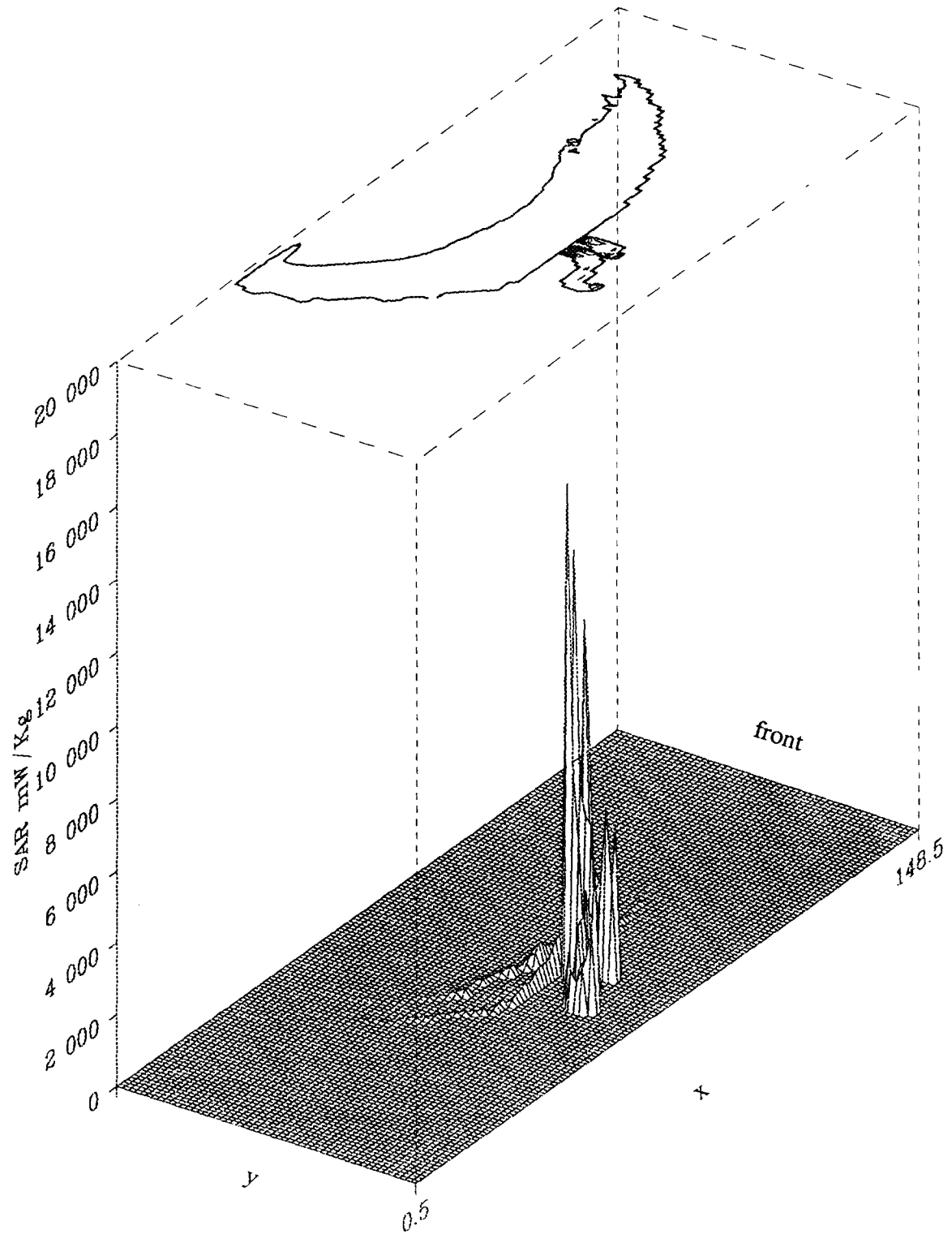
b. layer no. 69
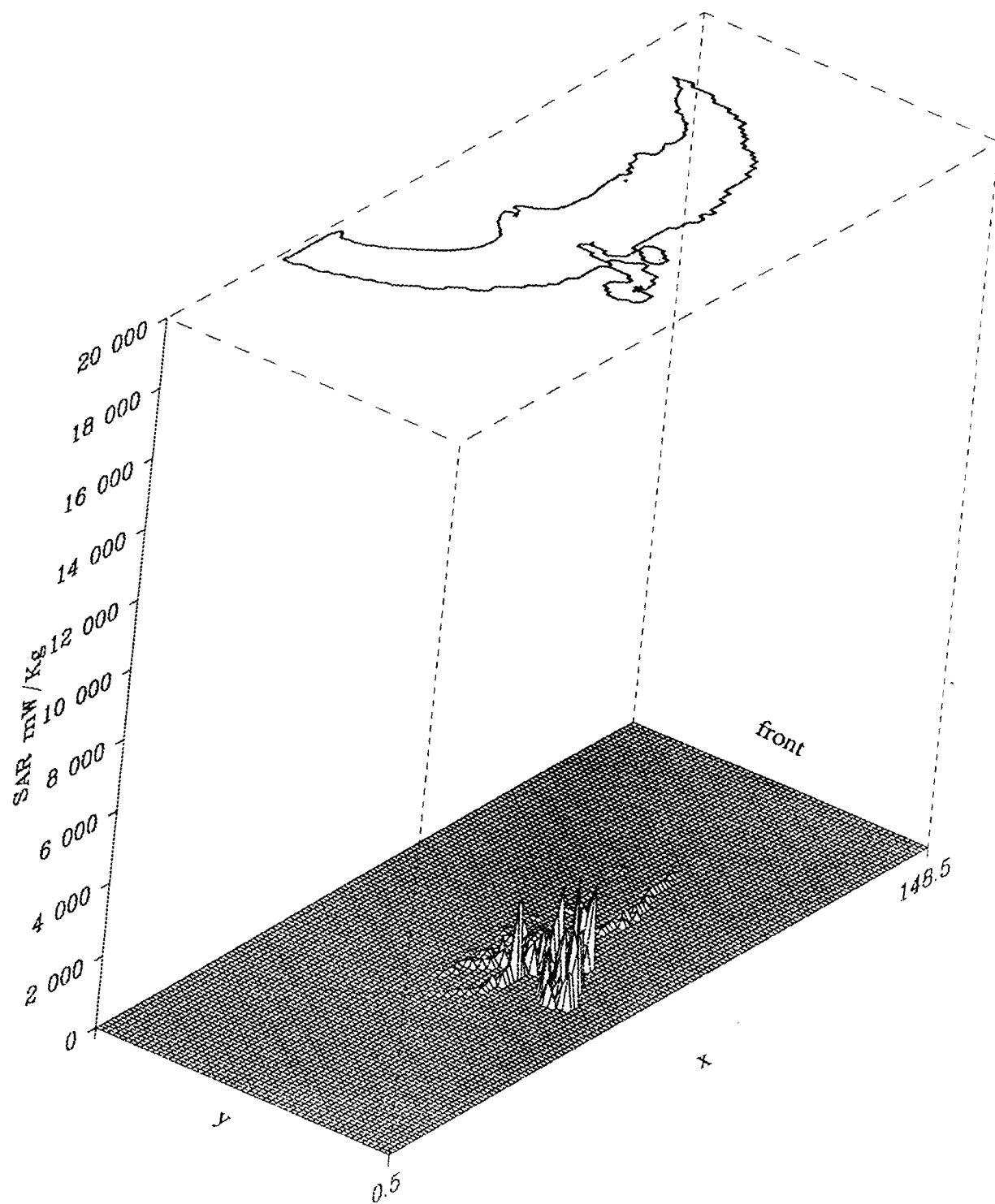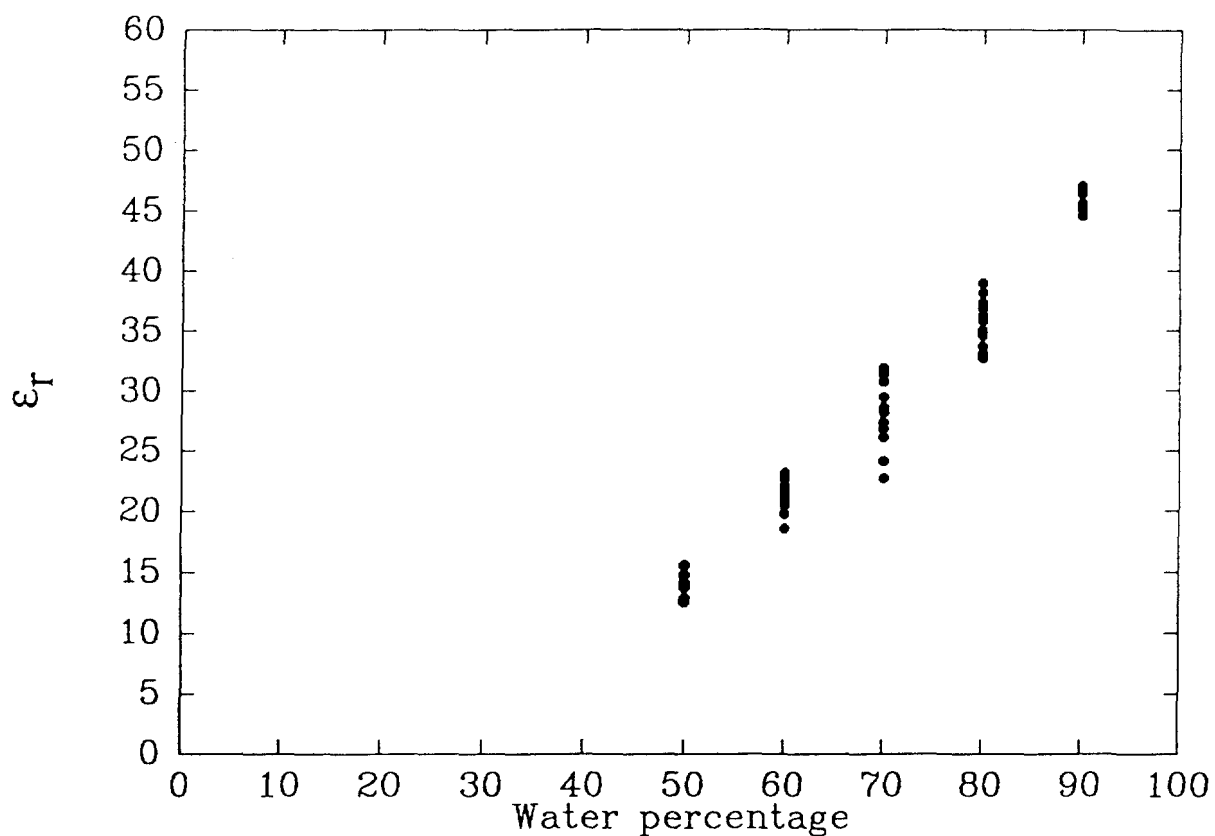

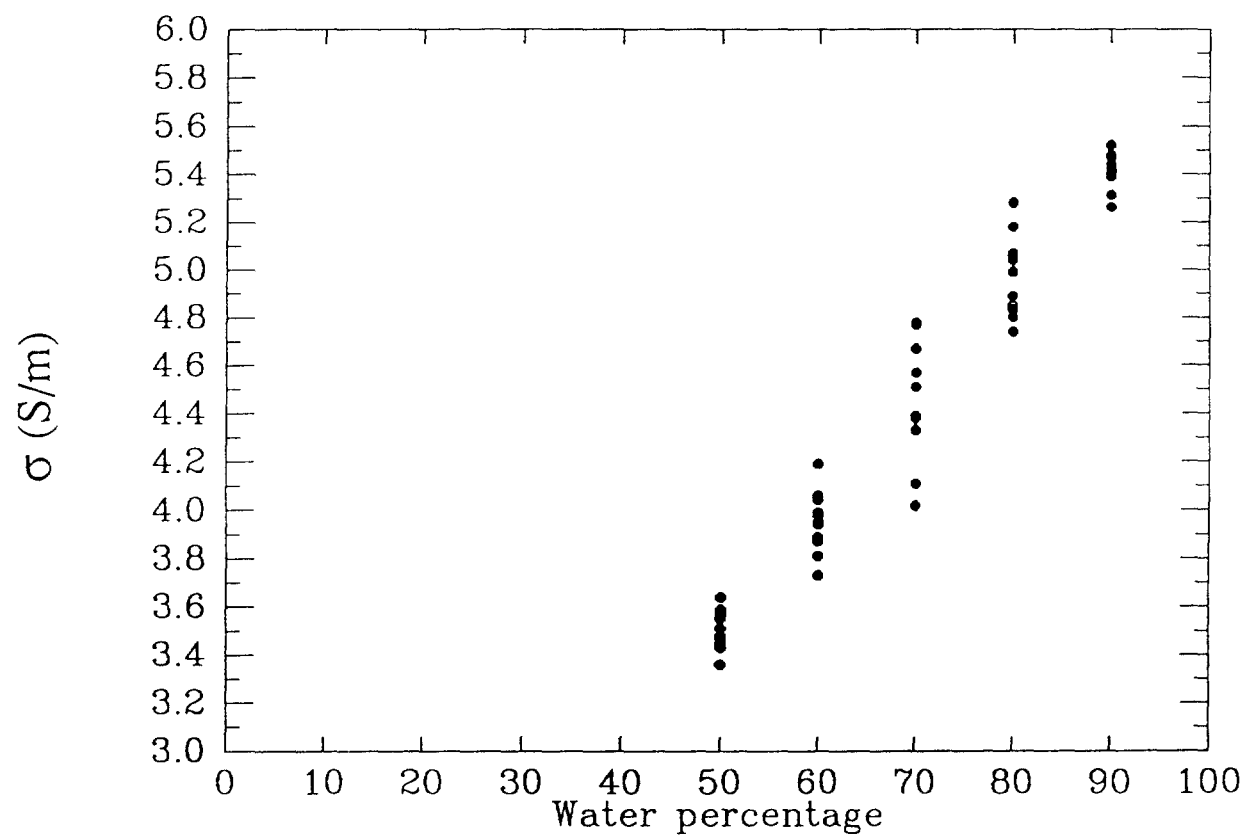Fig. 9. (continued)

c. layer no. 75

Fig. 9. (continued)

a. Dielectric constant ε_r.

Fig. 10. Measured variations of the ε_r and σ for the various compositions of water, polyethylene powder and Superstuff at 6 GHz. No salt was used for any of the compositions while water content was varied to be 50, 60, 70, 80, and 90 percent. For the various water percentages the contents of polyethylene powder and Superstuff were (43,7), (33,7), (13,7), (23,7) and (6,4) percent, respectively.
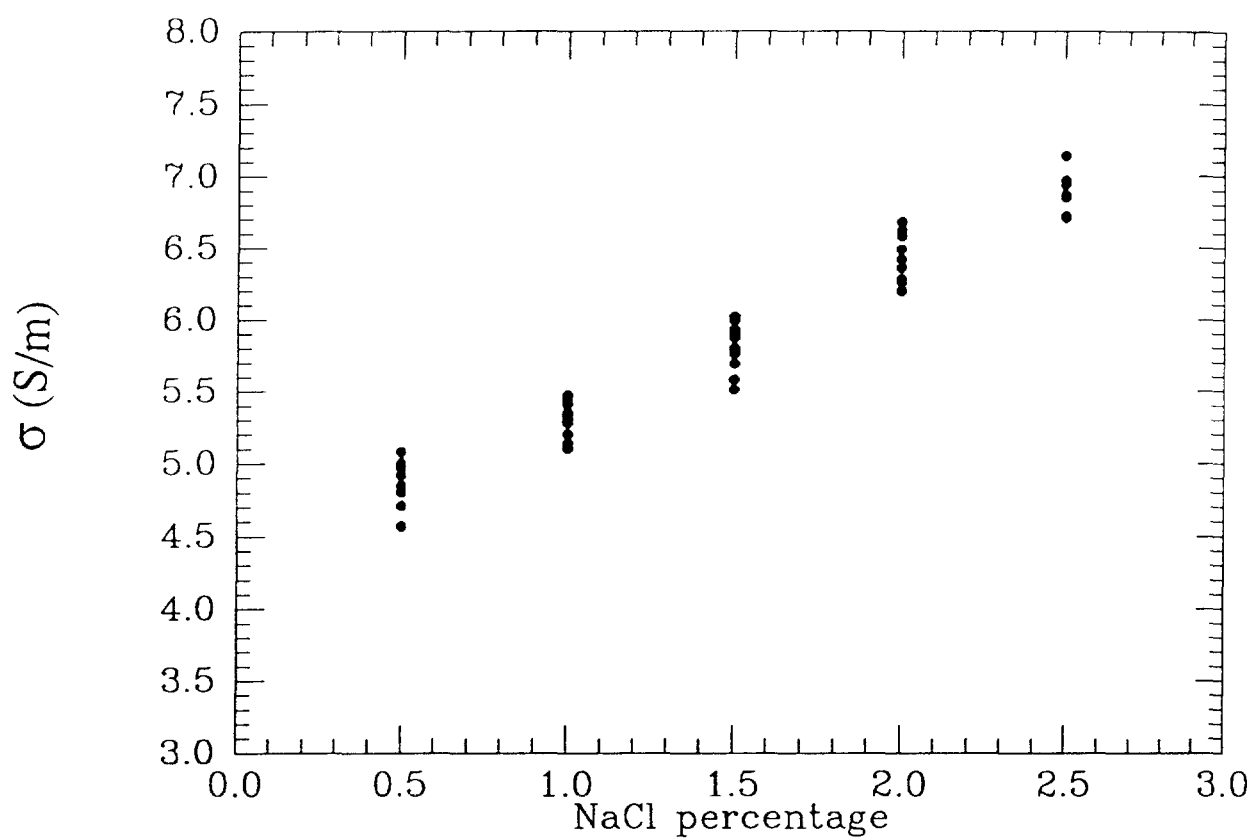
b. Conductivity σ.

Fig. 10 (continued).

Fig. 11. Measured variation of conductivity σ for increasing salt (NaCl) content of the mixtures. For each of these mixtures the water and Superstuff contents were 70 and 7 percent, respectively. As the salt content was increased from 0.5 to 2.5 percent, the polyethylene powder content was reduced from 22.5 to 20.5 percent. Dielectric constant ε_r ($\approx$ 28-30) did not vary much and hence is not shown.
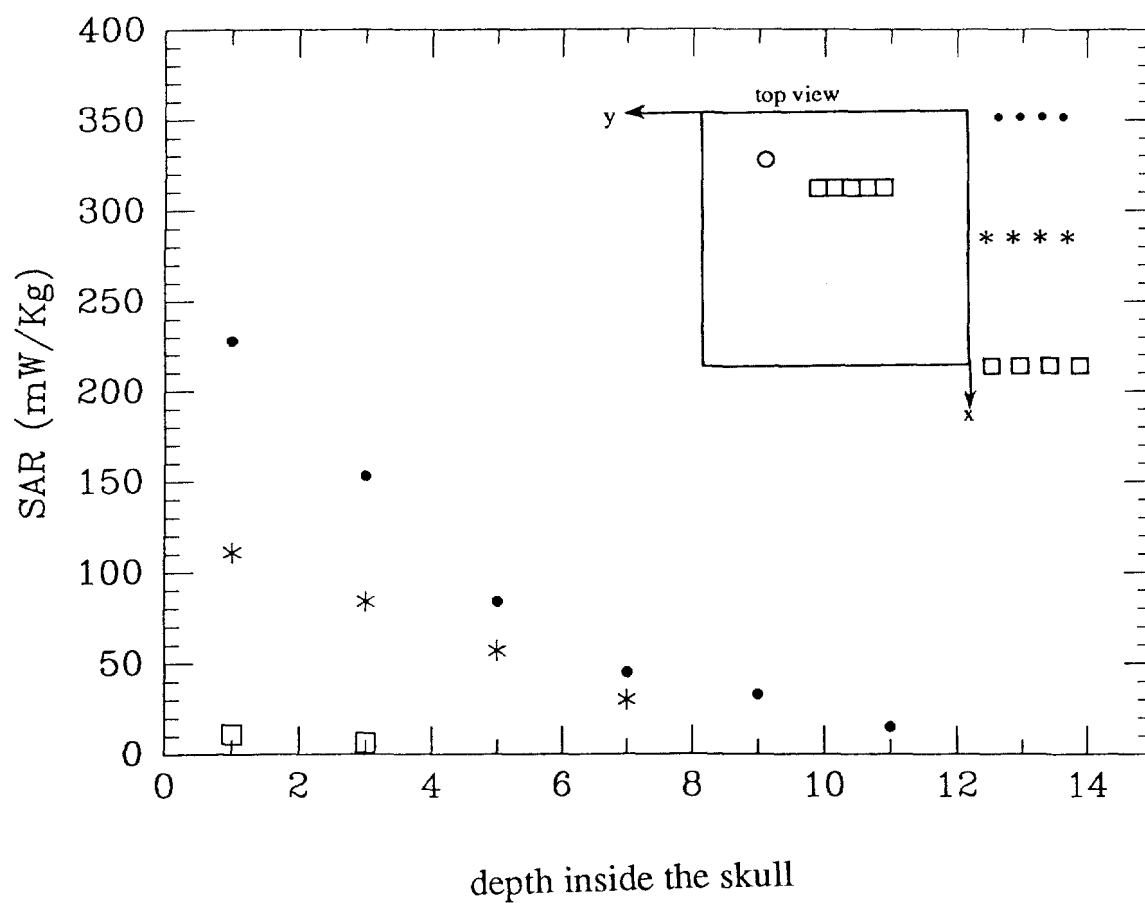
Fig. 12.   Measured SAR variations for Antenna 2 as a function of depth inside the brain-equivalent phantom for three lines as shown in the insert of the figure. The SARs were measured for a radiated power of 9 W and scaled back to the projected handset power output of 0.6 W.